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Validation of the Spanish version of the Drive for Muscularity Scale (DMS) among males: Confirmatory factor analysis

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ABSTRACT

Drive for Muscularity (DM) has been shown to be a relevant construct for measuring and understanding male body image. For this reason, it is important to have reliable and valid instruments with which to measure DM, and to date no such instruments exist in Spain. This study analyzes the psychometric and structural properties of the Drive for Muscularity Scale (DMS) in a sample of Spanish adolescent males (N = 212), with the aim of studying the structural validity of the scale by using a confirmatory factor analysis (CFA), as well as analyzing the internal consistency and construct (convergent and discriminant) and concurrent validity of the instrument. After testing three models, results indicated that the best structure was a two-dimensional model, with the factors of muscularity-oriented body image (MBI) and muscularity behavior (MB). The scale showed good internal consistency ($\alpha = .90$) and adequate construct validity. Furthermore, significant associations were found between DM and increased difficulties in emotional regulation (rho = .37) and low self-esteem (rho = −.19). Findings suggest that the two-factor structure may be used when assessing drive for muscularity among adolescent males in Spain.

1. Introduction

Past research on body image has tended to focus on women and their drive for thinness (DT). The majority of instruments that have traditionally been used to measure body dissatisfaction have focused on the pursuit of this thin ideal, thus leading researchers to conclude that boys and men, in comparison to women, are apparently less dissatisfied with their bodies (e.g., Feingold & Mazzella, 1998; Muth & Cash, 1997). However, there appears to be evidence that unlike the thin ideal pursued by women, men are more likely to desire a lean and muscular body (McCreary, 2007). This difference in the ideal body shape aspired for by men has led to a recent increase in research regarding male body image (e.g., McCreary & Sasse, 2000; Tylka, Bergeron, & Schwartz, 2005) and subsequent findings on the important role played by muscularity (e.g., Cafri & Thompson, 2004a) as well as on ways to measure the drive for muscularity (McCreary & Sasse, 2000) in men.

Drive for muscularity (DM) in males is not only a representation of one's motivation to become more muscular, but also the extent to which they have internalized the messages from society that the mesomorphic (muscular) shape (Mishkind, Rodin, Silberstein, & Striegel-Moore, 1986) is the ideal of physical attractiveness for their gender (McCreary, 2007). The pursuit of this muscular ideal has been found to be associated with negative affect and low self-esteem, as well as with increased rates of anabolic-androgenic steroid use (Cafri et al., 2005). Regarding adolescent populations in particular, McCreary and Sasse (2000) found that higher levels of DM among high school age males were significantly related to poor self-esteem and high levels of depression. Finally, Davis, Karvinen, and McCreary (2005) found that men with a high level of DM presented a similar psychological profile to women with a high DT. These authors propose that just as these traits in women may encourage preoccupying thoughts about the ideal body shape, leading them to engage in unhealthy behaviors in pursuit of said ideal, the same may be true for men.

In order to measure DM and further explore its association with psychological and physical consequences, it is important to have reliable and valid measures. However, there is currently no instrument validated for use in Spain that measures DM and it is therefore impossible to measure the prevalence rates of this phenomenon among Spanish males. This drive has been found among male adolescents in other Western countries (McCreary & Sasse, 2000) and there is reason to believe that similar results could be found in Spain. First, prevalence rates of eating disorders in Spain are very similar to those found in other developing nations. As regards adolescent population in particular, the rate is 1–3% for both genders and 4–5% for females (Peláez Fernández, Raich Escursell, & Labrador Encinas, 2010). Second, according to media theory, the increase in the drive for muscularity among males is largely due to the media's focus on the muscular ideal (Gray & Ginsberg, 2007). Given the fact that Spain is exposed to many of the same media sources as individuals in other Western countries, there is reason to believe that

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this may have a similar influence on their ideas about the body that they should possess. A study exploring the ideal body of males in two other Western European countries (France and Austria) with that of the United States found that men in all three countries chose an ideal body that was a mean of 28 lb (13 kg) more muscular than themselves (Pope, Gruber, et al., 2000).

To date, four questionnaires have been developed: the Drive for Muscularity Scale (DMS; McCreary & Sasse, 2000); the Drive for Muscularity Attitudes Questionnaire (DMAQ; Morrison, Morrison, Hopkins, & Rowan, 2004); Yelland and Tiggemann's (2003) Drive for Muscularity Scale (YT-DMS); and the Swansea Muscularity Attitudes Questionnaire (SMAQ; Edwards & Launder, 2000). Although a recent study of the psychometric properties of the YT-DMS (Tod, Morrison, & Edwards, 2012a) demonstrated the promise of the instrument in the study of DM, the authors note that aspects relevant to DM may be missing from the measure and there are a lack of studies employing this measure (Yelland & Tiggemann, 2003; Tod et al., 2012a; Tod, Morrison, & Edwards, 2012b). In a review of the Likert-based measures available for evaluating body image, Cafri and Thompson (2007), evaluated the DMS, SMAQ and DMAQ, concluding that the DMS and DMAQ were both effective measures for assessing a muscular body image, noting that the DMS was of particular strength due to the fact that it has been used more extensively and therefore there was more data available regarding its validity and reliability. The SMAQ was not recommended due to several criticisms such as the inappropriate method of factor rotation used when conducting an exploratory factor analysis and excessive double loadings of several of the items (Morrison et al., 2004).

The DMS (McCreary & Sasse, 2000) is a 15-item self-report questionnaire, which measures a person's perceptions of how muscular they want to be, as well as the behaviors that they engage in to become more muscular. The authors intentionally included items to reflect attitudes as well as behaviors, in order to reflect the fullest meaning of the drive for muscularity (McCreary, 2007).

The developers of the DMS intended for it to be used as a single score questionnaire (McCreary, 2007), however exploratory factor analysis demonstrated a two-factor model in samples of men, with attitude and behavior items loading on two distinct factors. The authors decided to refer to the scale containing the attitude items as the Muscularity-oriented body image (MBI) subscale and that with the behavior items as the Muscularity-oriented behavior (MB) subscale (McCreary, Sasse, Saucier, & Dorsch, 2004). Each item is scored on a 6-point Likert-type scale ranging from 1 (*never*) to 6 (*always*), with higher scores indicating a higher drive for muscularity. A total score of the DMS can be determined by averaging the 15 items. Individual subscale scores for the two subscales (MBI-7 items, and MB- 8 items) can be determined by averaging the items that pertain to that particular subscale. Item number 10, ¨I think about taking anabolic steroids¨ showed little variability in samples of high school and university students, and it can be included or excluded based on the researchers' discretion, although McCreary et al. (2004) recommended its exclusion when calculating the total score. Prior studies have found good reliability (internal consistency and test–retest) and validity in both the 15-item version and 14-item version of the DMS (McCreary et al., 2004). Internal consistency alphas among prior studies have ranged from .85 to .91 among male participants (Cafri & Thompson, 2004b; Davis et al., 2005; Mahalik et al., 2003; McCreary et al., 2004; McCreary, Saucier, & Courtenay, 2005; McPherson et al., 2010; Wojtowicz & von Ranson, 2006). In terms of test–retest reliability, Cafri and Thompson (2004b) reported high 7–10 day test–retest correlations in a sample of men: .93 for the entire scale, .96 for the MB subscale and .84 for the MBI subscale. Although the DMS has been frequently used to measure drive for muscularity, the majority of research regarding the psychometric properties of this measure has taken place among homogenous, North American, collegiate populations and McCreary et al. (2004) have recommended additional psychometric evaluation among a wider variety of participants.

While the DMS has been validated among university males in Mexico (Escoto et al., 2013) and Argentina (Compte, Sepúlveda, de Pellegrin, & Blanco, 2015), it is important to note that certain language and cultural differences exist between different Spanish speaking countries. In this light, it is important that this instrument also be validated specifically for its use among males in Spain. The present article aims to present the first validation data of the Spanish version of the Drive for Muscularity Scale (DMS) in a non-clinical, adolescent male sample. In order to do so, we aim to: (a) study the structural validity of the DMS using a confirmatory factor analysis (CFA); (b) test the internal consistency of the Spanish version of the DMS for the total score and for each subscale, and (c) to test the validity of the instrument by assessing the convergent (i.e., how the DMS correlates with a similar measure designed specifically for males, but which measures general body dissatisfaction) discriminant (i.e., the relationship between DM and DT) and concurrent (i.e., how the DMS correlates with other psychological variables) validity. We expected that the DMS total score, and subscale scores, would not be correlated with the subscales of the Eating Disorders Inventory (EDI-2), thereby supporting our hypothesis that DM and DT are separate constructs.

2. Method

2.1. Participants

Two hundred and twenty-five adolescent males took part in the study, ranging from 12 to 17 years of age ($M = 14.4$, $SD = 1.5$). All of the participants were recruited from a Secondary School in Madrid, Spain (7th to 12th grades). Their Body Mass Index (BMI = weight (kg) / height $(m)^2$) was calculated based on self-reported height and weight. The average BMI for the participants was 20.5 ($SD = 2.97$). Out of the 225 students who agreed to participate in the study, 13 of them (5.8%) left more than two items blank on the DMS-S. Given the fact that this was a small percentage of the total participants, we carried out further analysis of the missing data and discovered it was randomly distributed, which indicated that the elimination of these subjects would not influence the results of the study. With this in mind, the decision was made to exclude these participants from subsequent statistical analyses.

2.2. Measures

The participants completed the previously described DMS, as well as the following instruments:

2.2.1. Demographic Questionnaire

On this form, the student indicated his age, grade, height and current weight. Additionally, questions were asked regarding their parent's education and employment status.

2.2.2. Male Body Attitudes Scales (MBAS; Tylka et al., 2005; Sepulveda et al., in press)

The MBAS assesses men's dissatisfaction with their bodies. It consists of 24 items rated on a 6-point Likert type scale, which ranges from 1 (never) to 6 (always). It is made up of three subscales measuring Low Body Fat (eight items, i.e. “I think my body should be leaner”), Height (two items, i.e. “I wish I were taller”) and Muscularity (ten items, i.e. “I wish my arms were stronger”). The Spanish version of the scale includes 22 items and two subscales (low body fat and muscularity) (Sepulveda et al., in press). The Spanish version shows good internal consistency ($\alpha = .90$ for the total scale, $\alpha = .85$ for the Low body fat subscale and $\alpha = .89$ for the Muscularity subscale). For the current sample, Cronbach's alpha was .90 for the total scale. Higher scores indicate greater male body dissatisfaction.